

Claims

1. A nozzle device for a turbine of a turbocharger, comprising a variable annular nozzle (2) defined between an inboard wall (3) and an outboard wall (4), wherein said outboard wall (4) is axially movable for completely closing said variable annular nozzle (2).
2. The variable nozzle device according to claim 1, wherein an annular arrangement of vanes (5) is interposed in said variable annular nozzle (2), and said outboard wall (4) is constituted by a tube-shaped piston (6, 106) which is axially slidable into the radial inside or onto the radial outside of said annular arrangement of vanes (5) so as to contact said inboard wall (3).
3. The variable nozzle device according to claim 2, wherein said tube-shaped piston (106) comprises a stepped portion (117) which is axially slidable onto the radial outside of said annular arrangement of vanes (5), said stepped portion (117) directs exhaust gas entering into the turbine to the downstream side of the turbine.
4. The variable nozzle device according to any one of claims 1 to 3, wherein said annular arrangement of vanes (5) extends only over a part of the maximum interval between said inboard and outboard walls (3, 4).
5. The variable nozzle device according to any one of claims 1 to 4, wherein said inboard wall (3) is constituted by a vaned shroud (7) having said annular arrangement of vanes (5).

6. A turbocharger (8) having a turbine (1) comprising the variable nozzle device according to any one of claims 1 to 5.

7. An engine boosting system comprising a parallel configuration of at least a first and a second turbocharger (9, 8), wherein a turbine (1) of said second turbocharger (8) is characterized by a variable nozzle device which is capable of completely closing the nozzle opening thereof.

8. The engine boosting system comprising a parallel configuration of turbochargers according to claim 7, wherein the second turbocharger (8) is a turbocharger according to claim 6.

9. A method for operating an internal combustion engine with a parallel configuration of turbochargers (9, 8) according to claim 7 or 8, wherein the variable nozzle device of the second turbocharger (8) completely closes its nozzle opening when said second turbocharger (8) is driven under low rotational speed of the engine.

10. Diesel engine boosting system comprising a turbocharger according to claim 6 and control means for closing the turbine annular nozzle (2) to an optimum position for engine braking where there is provided a high boost pressure and a high back pressure at the same time.

11. An engine boosting system comprising a turbocharger (8) and a catalyst (40) disposed downstream of said turbocharger (8), wherein the turbocharger (8) comprises an exhaust gas driven turbine (1) having a turbine wheel (13) and an annular nozzle (2) which can be opened such that the exhaust gas flow substantially bypasses the turbine wheel (13).

12. The engine boosting system according to claim 11, comprising a turbocharger (8) according to claim 6.